

WHAT IS CLAIMED IS:

1. A method for referencing or registering a patient or a patient body part in a camera-assisted, medical navigation system comprising the following steps:

- the patient body part to be referenced is brought into the detecting range of a navigation system assisted by at least two cameras, this navigation system detecting with computer support the three-dimensional, spatial positions of light marks,
- light marks are generated on the surface of the part of the body to be referenced by means of a light beam, the three-dimensional position of the light marks being determined by the camera-assisted navigation system,
- the three-dimensional position of the surface of the part of the body to be referenced is determined by means of the positional data for the light marks.

2. The method as set forth in claim 1, wherein the spatial position of said surface is assigned to a set of image data, previously produced by an imaging technique, for said part of the body concerned, especially a CT, MRI (magnetic nuclear resonance tomograph), PET, SPECT, x-ray or ultrasound scan data set to update-reference said image data of this data set.

3. The method as set forth in claim 1 or 2, wherein said light beam is a beam of invisible light, in particular infrared light, said cameras being set to detect the reflections for this light.

4. The method as set forth in claim 3, wherein said light beam is a laser light beam.

5. The method as set forth in claim 3 or 4, wherein by means of a second beam of visible light, aimed substantially at the same target area as that of said invisible referencing light beam, a visible light reflection is created on said surface.

6. The method as set forth in claim 5, wherein said second light beam is a visible laser beam.

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7. The method as set forth in claim 6 or 7, wherein said two light beams are generated by two light sources located juxtaposed or nested.

8. The method as set forth in any of the claims 1 to 7, wherein several light marks are generated in sequence on said surface by said referencing light beam, while the position of said generated light marks is detected all the time, i.e. in particular until a sufficient number of positional data for determining said spatial position has been acquired.

9. The method as set forth in any of the claims 1 to 8, wherein either the camera arrangement or said body part to be referenced is moved during referencing so that camera shades are eliminated, a relative movement of said body part being tracked in said navigation system by means of a marker array fixedly positioned relative to said body part.

10. An apparatus for referencing or registering a patient or patient body part, including a medical navigation system assisted by at least two cameras, which detects with computer support the three-dimensional, spatial positions of light marks in a detection area, and means for generating said light marks on the surface of said body part to be referenced, the three-dimensional, spatial position of said light marks being determined by said camera-assisted navigation system, wherein said means for generating said light marks is a light beamer producing light reflections on said surface as light marks.

11. The apparatus as set forth in claim 10, wherein said light beamer is a beamer for invisible light, in particular infrared light, said cameras being set to capture the reflections of said light.

12. The apparatus as set forth in claim 11, wherein said light beamer is a laser light beamer.

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13. The apparatus as set forth in claim 11 or 12, wherein said light beamer beams a second beam of visible light, aimed substantially at said same target area as that of said

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14. The apparatus as set forth in claim 13, wherein said second light beamer is a beamer for visible laser light.

15. The apparatus as set forth in claim 13 or 14, wherein the light sources for said beams are unified into a single light source or are two juxtaposed or two nested light sources.

16. The apparatus as set forth in any of claims 10 to 15, wherein it comprises a marker array, fixedly positioned relative to said body part, by means of which a relative movement between said body part to be referenced and said camera arrangement is tracked to eliminate camera shades during referencing.

5. The apparatus as set forth in claim 13 or 14, where the light sources are unified into a single light source or are two juxtaposed light sources.

6. The apparatus as set forth in any of claims 10 to 14, wherein the light source is a light ray, fixedly positioned relative to said body part, by means of which the light source is positioned between said body part to be referenced and said camera and the light source is shielded from the camera shades during referencing.